

Radio Astronomy April 2008 report

6, 8, 10, and 15 Apr 08 – DSS43 supported spectroscopy observations at 22 GHz for a host country project searching for H₂O molecular maser lines in galactic centres.

20, 26, 27, and 30 Apr 08 - DSS43 supported spectroscopy observations at 23 GHz for a host country project mapping ammonia molecular lines of dark clouds in the Galactic plane. During the 26th of April support, it was discovered that the subreflector didn't continue to track when moving from one source to the next - X-axis errors were reported. This problem was temporarily solved by a script prepared by the TDN team to send a TRK SR command at each slewing.

9 and 11 Apr 08 - DSS34 spectroscopy observations at Ka-Band were supported for a host country project surveying HC5N molecular line emission around the Galactic Centre.

A script provided by J.E. Clark (JPL) to erase Mark 5 disks was installed on the PC Field System (PCFS) and tested successfully.

The Proceedings of IAU Symposium 242, 2007 "Astrophysical Masers and their Environments", eds. JM Chapman and WA Baan, Cambridge University Press (2008), arrived this month. There are three papers in the volume discussing results obtained by DSS43: J.M. Chapman et al. "A Search for water maser emission from post-AGB stars", LJ Greenhill "Masers in AGN environments", and S Horiuchi and J Lovell "Maser science at Tidbinbilla".

Radio Astronomy May 2008 report

3, 4, 10, 13, 18 and 25 May 08 – DSS-43 supported 23GHz host country spectroscopy observations that were seeking to detect ammonia molecular lines from dark clouds in the Galactic plane.

14 and 31 May 08 – DSS-34 supported Ka-Band host country spectroscopy observations to survey HC5N molecular line emissions around the Galactic Centre.

6-7 May 08 – A Space Geodesy Program (SGP) run CRDS46 was supported by DSS-45 for 24 hours in combination with HarTRAO station in South Africa. All data were recorded using the hard-disk based Mark-5 system and shipped to the USNO correlator in Washington DC for processing.

Radio Astronomy June 2008 report

6 and 7 Jun 08 – Australian VLBI (LBA) observations were supported by DSS-43 using ATOT and GBRA blocks of time (18 hours in total). This support was provided for a couple of LBA projects to study radio galaxies (6 June) and a supernova (7 June) at S-Band, undertaken by five other Australian sites (ATCA, Ceduna, Hobart, Mopra, and Parkes). All data was recorded on Apple Xraid hard-disk packs (LBA Data Recorder) to be processed by the Swinburne University correlator.

12, 14, 22, 23, 28 and 29 Jun 08 - DSS-43 supported spectroscopy observations at 23 GHz for a host country project searching for ammonia molecular lines of dark clouds in the Galactic plane.

15-16 Jun 08 - DSS-45 in combination with DSS-15 supported an RFC CAT M&E observation. This was a 24 hour one baseline VLBI experiment at S and X-Bands. Data was recorded using both Mark 4 tapes and Mark 5 disk packs (piggyback mode).

Radio Astronomy July 2008 report

11, 13, 19, 20, and 29 Jul 08 – DSS-43 performed spectroscopy observations at 23GHz in support of a host country project searching for ammonia molecular lines from dark clouds in the Galactic plane.

6, 9 and 16 Jul 08 - DSS-43 GBRA and Engineering time was used to gather pointing and gain data at K-Band. The data was used to update the K-Band pointing model, this resulting in a noticeable pointing improvement in subsequent observations. Antenna servo data was also captured during several of the boresight scans to facilitate further analysis.

Radio Astronomy August 2008 report

3 and 6 Aug 08 - DSS-43 ATOT and GBRA time was used to check the K-Band system in preparation for the LBA experiments scheduled in the following week. It became evident that because of an unexpected station wide power outage on Aug 2, the K-Band LNA package had warmed up resulting in a system noise temperature at zenith of ~100K (about 40K is normally expected for this time of the year). A recooling of the LNA package was completed on the 11 August.

8 Aug 08 – A single Australian VLBI (LBA) observation at K-Band was supported by DSS-43 using GBRA time (4 hours). This support was

provided for an LBA project searching for binary black holes in Active Galactic Nuclei. The project was supported by five other Australian sites (ATCA, Ceduna, Hobart, Mopra, and Parkes). Data were recorded on Apple Xraid hard-disk packs (LBA Data Recorder) for processing by the Swinburne University correlator.

9 and 10 Aug 08 – A single X-Band LBA observation was supported by DSS-45 using ANTICAL time (8 hours). This support was provided for a project studying gamma-ray quasars and involved five other Australian telescopes as well as Hartebeesthoek in South Africa. Data were recorded on Apple Xraid hard-disk packs (LBA Data Recorder) for processing by the Swinburne University correlator.

10 and 11 Aug 08 – An X-Band Australian VLBI (LBA) observation was supported by DSS-45 using GBRA time (8 hours). This support was provided for a project searching for LBA calibrators and involved five other Australian telescopes as well as Hartebeesthoek in South Africa. Data were recorded on a Mark5 disk pack at 512 Mbit/s, this being double the data rate for our normal operations. The disk pack was shipped to the Max Planck Institute Bonn Correlator for processing.

11 to 16 Aug - Shinji Horiuchi attended the General Assembly of the International Union of Radio Science held in Chicago, Illinois, USA.

18 to 25 Aug - Shinji Horiuchi visited JPL, ITT, and GDSCC and met various teams involved with CDSCC radio astronomy to discuss systems and operations. Whilst at GDSCC, assistance was provided with tests to determine the pointing stability performance of DSS-14 for comparison with that at DSS-43.

Radio Astronomy September 2008 report

2 Sep 08 - David McConnell from the ATNF/CSIRO visited CDSCC to discuss Host Country Project support.

6 Sep 08 – DSS-43 GBRA time was used to trouble-shoot and test the K-Band RF system in preparation for a 24 hour VLBI run scheduled for 14 Sept.

6-7 Sep 08 - DSS-45 in combination with DSS-15 supported an RFC CAT M&E observation. This was a 20 hour one baseline VLBI experiment at S and X-Band. Data was recorded on a Mark 5 disk pack. This was the first DSN VLBI run without tape recording.

14-15 Sep 08 – A series of astrometry VLBI observations at S and X-Band for reference frame sources (crfs12) was supported by DSS-43, the University of Tasmania Hobart antenna and the Hartebeesthoek radio observatory antenna in South Africa. Twenty six hours of DSS-43 ATOT A01 time was used to provide this support. Data were recorded on a Mark 5 disk pack and forwarded to the USNO Washington correlator for processing.

20-21 Sep 08 – Blocks of DSS-43 GBRA time were used to test the K-Band system and observing software.

The DSS-43 K-Band system has been suffering from communication problems with equipment mounted in the R&D cone since the power outage on the 26th of Aug. Communications have been partially recovered though investigations continue. An MMS Local Oscillator (LO) Module was also found to have a failed power supply. This has been swapped with the spare to return the MMS to service.

Radio Astronomy October 2008 report

Following further testing, the problem reported last month regarding local oscillator modules in the DSS-43 K-Band system was resolved. Host Country spectroscopy support had not been possible since the end of July.

6, 11 Oct 08 - DSS-43 supported spectroscopy observations at 22GHz for a new Host Country project searching for water molecular maser lines in the centres of X-ray emitting galaxies.

6 Oct 08 - DSS-43 supported spectroscopy observations at 23GHz for a Host Country project searching for ammonia molecular lines in infrared-dark clouds in the Galactic plane.

15, 18, and 23 Oct 08 - DSS-43 supported spectroscopy observations at 22GHz for a new Host Country project searching for water molecular maser lines in Galactic high-mass star-forming regions.

22 Oct 08 - Shinji Horiuchi was invited by the Canberra-Japan Club to present an introductory lecture on CDSCC and radio astronomy. The presentation was made at the Multicultural Centre in Civic.